Objective: To demonstrate the safety and efficacy of balloon mitral valvuloplasty in patients of rheumatic mitral stenosis and situs inversus with dextrocardia.
Background: Distorted cardiac anatomy and cardiac malpositions increase the complications of interatrial septal puncture and left ventricular entry during balloon mitral valvuloplasty.
Methods: Five patients with rheumatic mitral stenosis and situs inversus with dextrocardia were included in this study. Mean transmitral gradient before balloon mitral valvuloplasty (18 ± 6 mmHg) was significantly higher, while mitral valve area (MVA) (0.68 ± 0.4 cm^2) was significantly lower. All the five patients were young (mean age of 32 years) and symptomatic (mean pulmonary artery pressure 60 ± 10 mmHg). Left femoral venous and arterial approach was used. Fluoroscopic imaging was performed without inverting the images although the software for the same was available. The interatrial septum was approached using fluoroscopy guide with needle directed towards the spine and keeping the pointer of Brockenbrough needle at seven to eight O' clock position followed by transatrial puncture in left lateral view. The transit across the mitral valve was done in left anterior oblique view without using pseudo right anterior oblique imaging with just clockwise or counter clockwise guidewire movement. Simultaneous transthoracic echocardiography guidance was used.
Results: Pre and post balloon mitral valvuloplasty hemodynamic parameters were compared. Mean transmitral gradient before balloon mitral valvuloplasty (18 ± 6 mmHg) was significantly higher, while mitral valve area (MVA) (0.68 ± 0.4 cm^2) was significantly lower. All the five patients were young (mean age of 32 years) and symptomatic (mean PA pressure 60 ± 10 mmHg. After balloon mitral valvuloplasty, mean PA pressure was significantly reduced – [33.5 ± 12 mmHg], with a significant reduction in transmitral gradient (8.2 ± 3.5 mmHg), with an increase in mitral valve area (2.1 ± 0.6 cm^2).
Conclusion: This case series demonstrates the safety and efficacy of balloon mitral valvuloplasty without inverting the images on fluoroscopy.

Mitral valve repair – Is replacement not an ideal operation anymore?

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Introduction: MV repair remains standard of care in the world today. It is different in India with RHD. MV repair summary data by a single surgeon is presented here.
Methods: Prospective data on all MV repairs since 01/2004. Patients were regularly followed up and those unable to come were subject to a telephonic interview along with review of their latest ECHO report.
Results: 163 patients underwent MV repair between 01/2004 and 06/2015. The mean age of patients was 40 years (range 8–81). 58 (36%) were female patients. 70 (43%) were RHD patients, 40 (25%) degenerative mitral valve disease, 34 (21%) ischemic MR, 15(9%) congenital MV disease, 2(1%) with SBE and 2(1%) with other aetiologies. Majority (144, 88%) patients had NYHA class III and above symptoms. The mean EF was 53% (min 25% and max 79%). 10(6%) patients had incidental mild to severe MS while the rest had Grade 3 and above regurgitation. Meanpreop mitral annulus diameter was 38 mm (Min 23, Max 50). More than moderate PA pressures were present in 69 (42%) patients. All procedures were performed via median sternotomy. The complexity of the repair was reflected on the number of techniques needed to achieve competence. On an average, at least 2 techniques were necessary, while some patients needed as many as 6. Average follow up was 18 months in the cohort. The maximum follow up time was 96 months. 44 patients were lost to follow up. There were 2 deaths in the whole dataset, 1 was post operative mortality and one at 12 months follow up. Three patients had significant mitral regurgitation on follow up, one of whom has been reoperated. All of these patients were RHD.
Conclusion: Mitral valve repair, in expert hands provides good long term outcome, free from reoperation. Moreover morbidity and mortality related to anticoagulant therapy was significantly minimized

Acute and short term effect of balloon mitral valvuloplasty on p wave dispersion and atrial electro-mechanical delay in subjects of mitral stenosis

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Background: The predisposition to atrial fibrillation (AF) in mitral stenosis (MS) has been demonstrated with several electrocardiographic (increased P-wave dispersion) and echocardiographic parameters (atrial electromechanical delay). The effect of percutaneous balloon mitral valvuloplasty (PBMV) on these parameters and the onset of AF later have not been studied in detail till now.
Aim of the study: Acute (within 48 h) and short term (at 6 months) effect of PBMV on P-wave dispersion (PWD) and atrial Electro-Mechanical Delay (EMD) in patients of Mitral Stenosis and sinus rhythm.
Method: 34 patients of MS have been studied till date with follow up of 8 patients (study is ongoing and full data will be presented in conference). 12 lead ECG and detailed Echocardiographic evaluation was done for each patient one day before, at 48 hours after PBMV and at 6 months. The P-wave dispersion was calculated from12-lead ECG. Interatrial and intra-atrial EMDs were measured by tissue Doppler echocardiography. These ECG and echocardiographic parameters after PMBV were compared with baseline values. Additionally at 6 months 24 hour Holter monitoring has be planned to rule out paroxysmal AF.
Result: 34 patients of critical MS who underwent successful BMV have been studied till date (24 females and 10 males, aged mean 28.74 ± 8.55 years, with a mean MVA of 0.75 ± 0.15 cm^2). After PMBV, there was significant improvement in the interatrial EMD (46.03 ± 18.36 ms vs. 62.00 ± 28.11, $p < 0.01$) and left-sided intra-atrial EMD (34.65 ± 16.94 vs.49.32 ± 30.14, $p < 0.01$) compared to baseline with no significant change in right sided intraatrial EMD (16.41 ± 17.86 vs 15.65 ± 13.34, $p = 0.854$). There was also significant decrease in PWD following PBMV compared to baseline (34.12 ± 12.74 vs 41.88 ± 15.82, $p < 0.01$). In 8 patients who have completed 6 months follow up, there was tendency of further decrease in left sided EMD with no patient developing AF.

Study role of echocardiographic TDI (tissue Doppler imaging) and strain imaging for detection of subclinical LV dysfunction in patients of rheumatic mitral valve disease

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Background: Rheumatic mitral valve disease is a common disease in India. Even in the presence of preserved global LV function as measured by EF, in some RHD patients, impairment in long-axis function can occur early. Recently Impaired LV long- axis movement (by TDI) & myocardial strain is sensitive indicator of early myocardial dysfunction.
Aims and objectives: (1) To study TDI and its application in patients of Rheumatic MV disease. (2) To study the tissue Doppler velocities at the MV annulus. (3) To evaluate LV function in patients of rheumatic MV disease using strain& strain rate imaging.
Material and methods: This is single center prospective observational study conducted in 50 patients (pts) with rheumatic MS with or without MR with sinus rhythm in addition to 50 controls (cls). Pts with predecided inclusion & exclusion criteria were enrolled in this study & echo was done to measure MPI (tie) index, TD velocities (at the lateral MV annulus), Peak systolic myocardial velocity (Sm), Early diastolic velocity (Em) & strain imaging (SI) measured from averaged value of 6 LV segments from apical 4-C view.
Results: In this study mean age was 29.94 ± 8.02 in pts and 33.18 ± 9.0 in cls. Mean EF was 57.98 ± 2.527 in pts & 58.74 ± 2.783 in cls (p-.15). Mean MPI by TDI was 4560 ± .02740 in pts & 3934 ± .03543 in cls ($p < .0001$). Mean Sm was 7.98 ± 1.152 in pts & 13.44 ± 1.740 in cls ($p < .0001$). Mean Em was 8.70 ± 1.689 in pts & 16.18 ± 1.945 in cls ($p < .0001$). Mean averaged peak sys strain was 17.7820 ± 1.1182 in pts & 21.9384 ± 1.431 in cls ($p < .0001$). Mean averaged strain rate was 0.893 ± 0.855 in pts & 1.455 ± 0.142 in cls ($p < .0001$).
Conclusion: Using TDI, our study revealed that the MPI was significantly increased in pts compared to control group. Moreover Sm, Em velocity and peak strain and strain rate was significantly lower in patients compared to control group. Thus MPI, Sm & Em velocity and strain imaging can be useful in the detection of subclinical LV dysfunction in patients of rheumatic MV disease.

Use of tenecteplase in treatment of thrombotic prosthetic mitral valves

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Introduction: Prosthetic valve thrombosis is defined as any obstruction of the prosthesis by non-infective thrombotic material. The diagnosis of PVT is made by a combination of clinical data (sudden worsening of heart failure, absence of prosthetic valve sounds, pulmonary edema, cardiogenic hock) and echocardiography. PVT is a life threatening emergency and requires treatment at the earliest. Reported incidence of thrombosis of prosthetic mitral valve is 0.03–4.3% per year. Thrombectomy or valve replacement is the conventional treatment with an associated mortality rate of 4.7–20%.
Thrombolysis is emerging as a promising alternative to surgery with a success rate ranging from 75% to 83%. In recent years, thrombolytic therapy has evolved as a substitute to surgery. Various thrombolytic treatments have been reported with variable success rates including streptokinase, urokinase and recombinant tissue plasminogen activators. Most patients in published series have been treated with infusions of streptokinase or urokinase for 12–24 hours. However, the data on the use of tenecteplase (a synthetic tissue plasminogen activator) is limited.
It has been used extensively in acute myocardial infarction (including in our institute) but its use in PVT treatment has rarely been reported.
Aims and objectives: To study the efficacy and safety of single intravenous bolus administration of tenecteplase in the management of patients presenting with thrombosis of prosthetic mitral valves in comparison to the use of streptokinase.
Materials and methods: All patients who presented with symptoms, clinical findings and radiological reports suggestive of thrombosis of prosthetic mitral valves and who were not willing to undergo emergency mitral valve replacement were included in this study. Patients who had contraindications to thrombolysis were excluded.
Patients were offered both streptokinase and tenecteplase, choices differed as per financial constraints.
All consecutive patients presenting with thrombosis of prosthetic mitral valve, in NYHA Class III/IV were included in study if they were not willing to undergo emergency mitral valve replacement.
The diagnosis of thrombosis of prosthetic mitral valves was established mainly by trans-thoracic or trans-esophageal echocardiography and/or fluoroscopy.
Patients with contraindication for thrombolytic therapy were excluded from the study (i.e., previous haemorrhagic stroke or other stroke within one year or known intracranial neoplasm or Active internal bleeding -excluding menses or suspected aortic dissection).
The fibrinolytic agent used was tenecteplase given in weight adjusted dose. Fibrinolytic regimens used were streptokinase and tenecteplase, 0.5 mg/kg IV bolus administered over 5 s. Heparin infusion was usually introduced after fibrinolytic therapy. Heparin infusion to obtain a partial thromboplastin time between 70 and 90 s was continued for one week and then replaced by warfarin treatment adjusted to obtain optimal prothrombin time and international normalized ratio. The efficacy of fibrinolytic therapy was assessed from hemodynamic parameters derived from echographic examinations as well as on clinical grounds.
We defined success as:

- *Full*: hemodynamic normalization confirmed by cinefluoroscopy (normal mobility of tilting disks) or TTE/TEE data (normalization of transprosthetic gradient and valve area, normal mobility of leaflet, reappearance of click).
- *Incomplete*: significant clinical improvement without complete recovery of disc or leaflet motion on fluoroscopy and/or TTE.
- *Failure*: no clinical improvement, in many cases associated with death or complications.

Results: Complete resolution of hemodynamic abnormalities was seen in 13/13 patients who received tenecteplase while 16 out of eighteen patients had complete resolution with streptokinase. One patient had failure of therapy and succumbed to pulmonary edema and another had partial resolution.
In patients who received tenecteplase, symptoms improved markedly, and prosthetic-valve clicks reappeared after a mean (±SD) period of 67.5 ± 29 minutes (within 30 min in two patients).
No hemorrhagic complications were observed in any patients.
Two documented embolic event occurred during fibrinolytic therapy. (Brachial artery embolism, requiring embolectomy and stroke due to embolism.)
None of the patients required subsequent surgery, and all were alive and well after treatment and discharged in a stable condition on warfarin in 7–10 days.
Treatment of patients with thrombosis of a prosthetic valve remains controversial.
Our results in thirteen consecutive patients suggest that tenecteplase can be used safely in patients with prosthetic-valve thrombosis, resulting in rapid restoration of valve function as compared the conventionally used streptokinase, beside ease of administration, i.e., bolus verses prolonged infusion.